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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER				
PATEL, SMITA S				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary****Application No.**

10/553,490

**Applicant(s)**

POLLINGTON ET AL.

**Examiner**

SMITA PATEL

**Art Unit**

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 3, 4, 7, 8, 28-32, 35, 37 and 42-55 is/are pending in the application.
- 4a) Of the above claim(s) 7 and 55 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 4, 8, 28-32, 35, 37 and 42-54 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-848)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

#### **DETAILED ACTION**

1. This action is in response to the communication filed on February 17, 2009.
2. Claims 1, 3-4, 7, 8, 28-32, 35, 37 and 42-55 are pending. New claims 43-54 have been added by the applicant. Claims 2, 5-6, 9-27, 33-34, 36, 38-41 are cancelled by the applicant.

#### ***Election/Restrictions***

- Applicant's election with traverse of Group I, Claims 1, 3-4, 8, 28-32, 35, 37 and 42-54, in the reply filed on 02/17/2009 is acknowledged. The traversal is on the ground(s) that to reconsider withdrawing Claim 7 based on national stage application lacking unity of invention under Rule 475. However, this is not found persuasive because lack of unity can be established if the shared special technical feature (single, general inventive concept) does not make a contribution over the prior art. Since the shared special technical feature does not make a contribution over the prior art, as set forth in the rejection, restriction is proper.
- The requirement is still deemed proper and is therefore made FINAL.
- Claims 7 and 55 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Group II, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 02/17/2009.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. **Claims 1, 31, 43 and 50** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**As per Claims 1 and 43**, the term "to atmosphere" is not clearly defined in the disclosure as well as claimed invention. Applicant need to make appropriate correction.

**As per Claims 31 and 50**, the term "PGM" is not clearly defined in the disclosure as well as claimed invention. Examiner has considered PGM as containing either platinum or palladium for examining purpose. Applicant need to make appropriate correction.

***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140

F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. **Claims 1, 3-4, 28-29, 43-45 and 47-48** rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 39, 42-47 and 59 of copending Application No. 11/665,308. Although the conflicting claims are not identical, they are not patentably distinct from each other because scope of claims 1, 3-4, 28-29, 43-45 and 47-48 overlap with claims 39, 42-47 and 59 of copending Application No. 11/665,308 which teaches a method of decomposing nitrogen dioxide to nitrogen monoxide in an exhaust gas of a lean-burn internal combustion engine which comprising of the method steps which are substantially similar to applicant's claimed invention .

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 1, 3-4, 8, 28-32, 35, 37 and 42-54** are rejected under 35 U.S.C. 103(a) as being unpatentable over Murachi et al (European Pub. No.: EPO 758713 A1) in view of Subramanian et al. (European Pub. No.: EP 0541271 A1).

**As per Claims 1 and 43**, Murachi teaches method of NO in the exhaust gas of diesel engine by decomposing NO<sub>2</sub> to NO. Further Murachi teaches substrate made of zeolite ZSM-5 (considered acidic refractory oxide) and metal such as copper and iron (considered metal or compound) which are attached to the substrate (abstract, Col.4 lines 16-24 and 50-59, Col.5 lines 1-43, Col.16 lines 15-23 and 34-59 and Col.17 lines 1-24 and 45-55). However Murachi does not expressly mention adjusting the HC:NOx ratio of the exhaust gas from 0.1 to 2.

However, Subramanian teaches a method of treating the exhaust gas from fossil-fueled engine comprising operating the engine under lean-burn conditions while controlling the emission ratio of NOx:hydrocarbon to be in range of 1:3 to 3:1 (encompasses the molar ratio of HC: NOx); exposing the exhaust gas to a first catalyst stage comprising mixture

of Cu-ZSM5 (zeolites as refractory oxide and copper as refractory oxide support) and exposing the effluent from said first catalyst stage to second catalyst stage (passing the effluent gas from contacting step) comprising an alumina support impregnated with an intimate mixture of lanthana and palladium (abstract).

It would have been obvious to one of ordinary skill in the art at the time of invention to combine the method of Murachi with Subramanian to improve the conversion efficiency of HC and NO<sub>x</sub> as taught by Subramanian.

**As per Claims 3 and 44**, Subramanian teaches the NO<sub>x</sub>:HC ratio of 1:3 to 3:1 (encompasses ratio of HC:NO<sub>x</sub>, abstract).

**As per Claims 4 and 45**, Subramanian teaches the temperature of 400° C (encompasses claimed range).

**As per Claims 8 and 46**, Subramanian teaches zeolite is selected from group consisting of ZSM-5 (abstract).

**As per Claims 28 and 47**, Subramanian teaches the step adjusting the HC:NO<sub>x</sub> ratio is effected by in response to the following inputs: Spark timing (considered as ignition timing), engine speed, and lambda value of the exhaust gas (page 3 lines 1-15).

**As per Claims 29 and 48**, Murachi teaches an engine map in response to the at least one input such as engine speed (figures 1 and 6) and Subramanian teaches adjusting HC:NO<sub>x</sub> ratio (page 3 lines 1-15).

**As per Claims 30 and 49**, Subramanian teaches the step of adjusting the HC:NO<sub>x</sub> ratio comprises at least adjusting air fuel ratio (Col.3 lines 1-15).

**As per Claims 31, 32, 35, 37, 42, 50, 51, 52, 53 and 54,** Murachi teaches further comprising contacting exhaust gas with oxidation catalyst such as platinum-based (considered PGM metal) oxidation wherein NO<sub>2</sub> decomposition catalyst is disposed downstream of the oxidation catalyst, particulate filter disposed between the oxidation catalyst, the NO<sub>2</sub> decomposition catalyst and NO<sub>2</sub> decomposition catalyst disposed on a downstream end of the filter and injecting a reductant into exhaust system upstream of the NO<sub>2</sub> decomposition catalyst (abstract, Col.4 lines 16-24 and 50-59, Col.5 lines 1-43, Col.16 lines 15-23 and 34-59 and Col.17 lines 1-24 and 45-55).

#### ***Conclusion***

- The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: US Patent 5,746,989, Murachii et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SMITA PATEL whose telephone number is (571)270-5837. The examiner can normally be reached on Monday-Thursday, 8:00-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Melvin Curtis Mayes can be reached on 571-272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SP, AU 1793  
04/30/2009

/Melvin Curtis Mayes/  
Supervisory Patent Examiner, Art Unit 1793